environment, temperature, humidity, etc., including the agricultural activities of man.

In Chapter 5 is discussed the pathological effects of the interactions of host and pathogen resulting in many kinds of symptom expression. In Chapter 6 the various prophylactic and therapeutic means of plant disease control are treated.

Principles of Plant Infection is a good book, a stimulating book with interpretations here and there that can and will be questioned and reconsidered by students of Plant Pathology—H. N. Hansen, Division of Plant Pathology, University of California, Berkeley.

Plants of Bikini and Other Northern Marshall Islands. By William Randolph Taylor. The University of Michigan Press, Ann Arbor, Michigan. xv + 1–227 pp., frontispiece, plates 1–79. 1950. $5.50.

As a senior biologist of the technical staff attached to the atomic-bomb tests of "Operation Crossroads," it was the responsibility of Professor Taylor to collect and catalogue the plants, with the exception of the phytoplankton and bacteria, that occur on the Atolls of Eniwetok, Bikini, Rongelap, and Rongerik.

Among those interested in the botany of the Pacific, it is well known that little information exists about the floras of many of the island groups in this large ocean. With respect to the northern Marshall Islands the situation was particularly bad, for, as the author points out, there was almost no background at all for a botanical survey—nothing was known of the cryptogamic floras.

The subject matter is treated under five main headings: In part one (pp. 1–4) the history of botanical exploration in the Marshall Islands as a group is briefly reviewed. In part two (pp. 5–13) the appearance and structure of the atolls is described, and a general account is given of the marine vegetation and the ecological conditions as encountered on the seaward reefs and in the lagoons. It is of interest to note that such ubiquitous tropical genera as *Sargassum* and *Galaxaura* are entirely absent and others such as *Codium* and *Dictyota* are very poorly represented. The vegetation of the seaward reefs is totally different from that in the lagoons. In both areas the littoral and upper sublittoral vegetation is extremely poorly developed, apparently owing to the intense insolation. Lithothamnioid algae, chiefly of the genus *Porolithon,* are the most important elements in the growth of the windward (eastern) side of the reefs and are of great importance in reef formation on the leeward side of the atolls also.

Part three (pp. 14–18) deals with the general characteristics of the land vegetation. It is pointed out (p. 14) that: "The land flora of the four atolls is essentially uniform. There are no differences with respect to basic vegetation between any of the atolls, and infrequent and introduced wild species nowhere alter the botanical aspect of an island." In part four (pp. 19–39) a

more detailed summary account is given of the islands (more than 50 were visited) in each of the four atolls.

Part five (pp. 40–209) consists of an annotated catalogue of the plants. The Latin diagnoses of the new species are assembled at the end of this section. Descriptions are provided for about 250 species, varieties, and forms (56 angiosperms, 1 moss, 11 fungi, and the remainder algae, all of which are marine in occurrence except for a few Cyanophyceae). Seventeen species and forms of algae and four species of fungi are regarded as new to science.

In the identification of the species, Professor Taylor had the assistance of various experts. However, except for the blue-green algae, the fungi, and a few other species, the task of drawing up the descriptions fell on his shoulders. The masterly way in which this was done is proof of Professor Taylor's versatility as a botanist.

Descriptions are furnished only for the species, varieties, and forms. Many of them are illustrated with photographs of the habit. In the majority of instances, the photograph of the habit clearly reveals the outstanding features of the entity but in others, such as *Halimeda,* it would have been extremely helpful if anatomical details had also been illustrated, as they were in some of the Corallinaceae. In most instances, except for the angiosperms, the date of publication of the genus is given. One wonders why this was not done for the species also, and it is especially to be regretted that in many instances the reference to the species or the forms with which they are compared (e.g., *Haloplegma Duperreyi* subsp. *spinulosum* Howe, p. 138) was not given in the bibliography. The citation of this essential literature would have enhanced the value of the book and would not have increased its bulk by more than a few pages. On the other hand, a few of the references which are given, such as those of Børgesen on *Rosenvingia stellata* (now *Iyengaria stellata* (Børg.) Børg.) and *Platysiphonia,* could safely have been omitted since they are not particularly relevant.

For several genera, a wrong date of publication is given. In the following list the year of publication is that given in parentheses: *Cladophoropsis* Børgesen, 1909 (1905); *Microdictyon* Decaisne, 1839 (1841); *Acetabularia* Lamouroux, 1816 (1812); *Tydemania* Weber-van Bosse, 1911 (1901); *Spermothamnion* Areschoug, 1877 (1847).

Inasmuch as the author alone is responsible for the greater part of the account dealing with the marine algae and since this is the group with which the reviewer is most familiar, a few critical comments may be appropriate.

Despite the convincing arguments of Børgesen, Feldmann, and others for the separation of the members of the Siphonocladales into several families, Professor Taylor still places *Valonia, Val-*

oniopsis, Dictyosphaeria, Cladophoropsis, Boodlea, Rhipidiphyllon, and *Microdictyon* in the single family Valoniaceae. Børgesen and others would assign only *Valonia* and *Dictyosphaeria* to the Valoniaceae.

Notice has apparently not been taken of the fact that *Valonia Forbesii* has been made the type of a distinct genus independently by Feldmann (C. R. Acad. Sci. Paris 206: 1504. May 1938, as *Boergesenia*) and Iyengar (Jour. Indian Bot. Soc. 17: 194. June 1938, as *Pseudovalonia*).

In discussing the new species, *Caulerpa bikinensis,* the author remarks (p. 66): "Difficult though the [*Caulerpa racemosa*] group is, one can clearly recognize certain lines of specialization and these lines deserve species rank, understanding that, where conditions do not favor the full expression of the differences to which a plant has genetically attained, recapitulation may cause simpler ramellar forms to be exhibited. Examples would include *C. peltata* and *C. bikinensis,* . . ." This view is at variance with that taken by Eubank (Univ. Calif. Publ. Bot. 18: 409–432. 1946.) in her study of the Hawaiian species of *Caulerpa.* On the basis of her own observations and those of other investigators of *C. peltata,* she concluded that this entity intergraded to such a perplexing degree with variants of *C. racemosa* that it was not possible to accord it more than varietal status. In the absence of experimental evidence it is futile to argue for or against recognition of *C. peltata* and various other entities of *Caulerpa* as species, varieties, or forms, except that it is more in keeping with current practice to consider them as intergrading variants of polymorphic species.

It is not clear whether or not the author regards all members of the Fucales as belonging to a single family. *Turbinaria* is assigned to the Fucaceae whereas most modern systematists give it a place in the Sargassaceae.

Botryocladia Kuckuckii is considered by Feldmann (and more recently by Børgesen) as synonymous with the older *B. Skottsbergii.* The author adopts the former name for the plant from Bikini without giving his reasons for differing from Feldmann.

Inasmuch as the families and genera are arranged in phylogenetic sequence in the groups to which they belong, it would have been more logical to place *Laurencia* and *Chondria* at the end instead of the beginning of the Rhodomelaceae.

In general, the nomenclature is up-to-date. The following are a few oversights to which attention may be drawn.

The transfer of *Asperococcus fastigiatus* Zanardini to *Rosenvingia* was made by Børgesen when he established the genus.

Acrochaetium is placed in the Chantransiaceae, but since it is now known that *Chantransia* as originally conceived did not include members of *Acrochaetium* or related genera there is no longer justification for failure to accept the family name Acrochaetiaceae.

The authors and dates of publication of *Neomeris* ("D'Archiac, 1843"), *Hypnea* ("Kützing, 1813"), and *Ceramium* ("Wiggers, 1817") are Lamouroux, 1816, Lamouroux, 1813, and Lyngbye, 1819, respectively. Wiggers did, to be sure, describe a genus *Ceramium* in 1780, but his genus was founded upon species of *Chorda, Furcellaria,* and *Gracilaria,* and did not include a single species of *Ceramium* in the sense that the genus is now accepted. *Ceramium* Lyngbye has been conserved.

The name *Roschera* Sonder (1879) should be supplanted by *Tolypiocladia* Schmitz (1897), since this name of Sonder is an orthographic variant of *Roscheria* Wendl. (1877), a palm genus. Both names commemorate Dr. Albrecht Roscher.

Although the flora of the northern Marshall Islands is not a rich one, the volume by Professor Taylor forms a most gratifying and welcome addition to organized knowledge of the marine algae of the Pacific. We now have for the first time a book giving good descriptions of some of the algae which students visiting the central Pacific could expect to find.

The University of Michigan Press has maintained its usual high standard in the printing and binding of the volume.—George F. Papenfuss, Department of Botany, University of California, Berkeley.

Anatomy of the Dicotyledons. By C. R. Metcalf and L. Chalk. Oxford at the Clarendon Press. Volume I, i–lxiv + 1–724 pp., Volume II, 725–1500 pp., 1950. $25.00.

In 1899 Solereder published his Systematic Anatomy of the Dicotyledons. This work resulted from a venture begun by Radlkofer and pursued further by his students, which sought evidence for the interrelationships between plants from the details of their anatomy. Solereder summarized the accumulated knowledge in the two volumes of his treatise. Since then many new facts have become available, necessitating some corrections in old observations. Metcalf and Chalk have attempted to bring all this material up to date, at the same time laying further stress on its relationships to Taxonomy. The present review will stress the taxonomic aspects of the work.

The preface outlines the authors' aims and objectives, while the introduction presents a resumé of generalizations as to the rôle of Plant Anatomy in Taxonomy. The body of the text outlines factual material relative to each family's normal and anomalous anatomical features, with additional phylogenetic, taxonomic, and economic notes, followed by lists of genera from which the factual data is derived, and, finally, pertinent bibliographic references. At the end of the work are interesting lists of plant families, each list exhibiting certain anatomical char-